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EXAMINER

LAM, VINH TANG

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/599,954	Applicant(s) SEETZEN, HELGE	
	Examiner VINH T. LAM	Art Unit 2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 July 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) 3,7-12 and 20-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-6,13-19 and 29-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on 13 October 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims **1, 2, 4-6, 13-19, and 29-32** are rejected under 35 U.S.C. 103 (a) as being unpatentable over **Baik (US Patent No. 7450104)** in views of **Childers et al. (US Patent No. 6817717)**.

Regarding Claims **1** and **31**, **Baik** teaches a method and a computer program product comprising a medium carrying computer readable instructions which, when executed by a processor, cause the processor to execute a method of processing a series of frames for displaying on a display having a first modulator disposed to illuminate a second modulator, the method comprising:

- (a) receiving a key frame image (Col. **5**, Ln. **41-42**, FIG. **1**);
- (b) calculating a key frame first modulation signal based on the key frame image (Col. **5**, Ln. **43-48**, Ln. **52-58**, FIG. **1**); and
- (d) for each of a plurality of frames in the series of frames (Col. **6**, Ln. **33-37**, FIG. **4**):
 - (i) receiving a current frame image (Col. **9**, Ln. **8-10**, FIG. **6**);

(ii) determining a current frame second modulation signal based on the current frame image and the key frame luminance map (Col. 9, Ln. 13-21, FIG. 6); and

(iii) selecting the key frame first modulation signal to be a current frame first modulation signal which is obviously and implicitly implied if there's no difference in brightness between previous and current frames (Col. 11, Ln. 14-17, FIGs. 7 & 8).

However, **Baik** does not teach (c) calculating a key frame luminance map corresponding to light incident on the second modulator when the first modulator is driven by the key frame first modulation signal.

In the same field of endeavor, **Childers et al.** teach (c) calculating a key frame luminance map corresponding to light incident on the second modulator when the first modulator is driven by the key frame first modulation signal (Col. 2, Ln. 35-50, FIG. 1).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine **Baik** teaching of calculating a key frame first modulation signal based on the key frame image and performing similar steps on the current frame with **Childers et al.** teaching of calculating a key frame luminance map corresponding to light incident on the second modulator when the first modulator is driven by the key frame first modulation signal in order to benefit of reducing time and cost by having a method comprising calculating a key frame first modulation signal based on the key frame image, performing similar steps on the current frame, and calculating a key frame luminance map corresponding to light incident on the second modulator when the first modulator is driven by the key frame first modulation signal in a dual modulation display.

Regarding Claim **29**, **Baik** teaches a method for processing a frame for displaying on a display having a first modulator disposed to illuminate a second modulator, the method comprising:

obtaining image data for a current frame (Col. **9**, Ln. **8-10**, FIG. **6**);

retrieving a predetermined luminance map corresponding to a predetermined first modulation signal for the first modulator (Col. **9**, Ln. **13-21**, FIG. **6**).

However, **Baik** does not teach determining whether the second modulator is capable of modulating the luminance map to reproduce the an image of the current frame on the display and generating a second modulation signal for the second modulator based on the image data for the current frame and the luminance map.

In the same field of endeavor, **Childers et al.** teach:

determining whether the second modulator is capable of modulating the luminance map to reproduce the an image of the current frame on the display (Col. **2**, Ln. **46-50**, FIG. **1**), and if so,

generating a second modulation signal for the second modulator based on the image data for the current frame and the luminance map (Col. **2**, Ln. **35-50**, FIG. **1**).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine **Baik** teaching of obtaining image data for a current frame and retrieving a luminance map corresponding to a first modulation signal with **Childers et al.** teaching of determining the second modulator modulating capability to reproduce the an image of the current frame and generating a second modulation signal based on the current frame data and the luminance map in order to benefit of reducing

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time and cost by having a method comprising obtaining image data for a current frame, retrieving a luminance map corresponding to a first modulation signal, determining the second modulator modulating capability to reproduce the an image of the current frame, and generating a second modulation signal based on the current frame data with its luminance map.

Regarding Claim **30**, **Baik** teaches a method for processing a plurality of frames for displaying on a display having a first modulator disposed to illuminate a second modulator, the method comprising:

obtaining image data for the plurality of frames (Col. **6**, Ln. **33-37**, FIG. **4**);

calculating a key frame first modulation signal for the first modulator based on the image data for a key frame of the plurality of frames (Col. **5**, Ln. **43-48**, Ln. **52-58**, FIG. **1**).

However, **Baik** does not teach calculating a key frame luminance map corresponding to light incident on the second modulator when the first modulator is driven by the key frame first modulation signal and generating a second modulation signal for each of the plurality of frames based on the image data for each frame and the key frame luminance map.

In the same field of endeavor, **Childers et al.** teach:

calculating a key frame luminance map corresponding to light incident on the second modulator when the first modulator is driven by the key frame first modulation signal (Col. **2**, Ln. **35-50**, FIG. **1**);

generating a second modulation signal for each of the plurality of frames based on the image data for each frame and the key frame luminance map (i.e. obvious because each frame is processed as current frame; Col. 2, Ln. 35-50, FIG. 1).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine **Baik** teaching of obtaining image data for the plurality of frames and calculating a key frame first modulation signal based on the key frame image data with **Childers et al.** teaching of calculating a key frame luminance map corresponding to second modulator when the first modulator is driven and generating a second modulation signal for each frame based on each frame image data and the key frame luminance map in order to benefit of reducing time and cost by having a method comprising obtaining image data for the plurality of frames, calculating a key frame first modulation signal based on the key frame image data, calculating a key frame luminance map corresponding to second modulator when the first modulator is driven, and generating a second modulation signal for each frame based on each frame image data and the key frame luminance map.

Regarding Claim 32, **Baik** teaches a system for displaying a series of frames on a display having a first modulator disposed to illuminate a second modulator, the system comprising a processor configured to:

- (a) receive a key frame image (Col. 5, Ln. 41-42, FIG. 1);
- (b) calculate a key frame first modulation signal based on the key frame image (Col. 5, Ln. 43-48, Ln. 52-58, FIG. 1);

(d) determine a key frame second modulation signal based on the key frame image and the key frame luminance map (Col. 9, Ln. 13-21, FIG. 6);

(f) for each of a plurality of other frames in the series of frames (Col. 6, Ln. 33-37, FIG. 4):

(i) receive a current frame image (Col. 9, Ln. 8-10, FIG. 6);

(ii) determine a current frame second modulation signal based on the current frame image and the key frame luminance map (Col. 9, Ln. 13-21, FIG. 6).

However, **Baik** does not teach to:

(c) calculate a key frame luminance map of light from the first modulator incident on the second modulator;

(e)/(iii) drive the first modulator with the key frame first modulation signal and drive the second modulator with the key/current frame second modulation signal to generate the key/current frame image on the display.

In the same field of endeavor, **Childers et al.** teach to:

(c) calculate a key frame luminance map of light from the first modulator incident on the second modulator (Col. 2, Ln. 35-50, FIG. 1);

(e)/(iii) drive the first modulator with the key frame first modulation signal and drive the second modulator with the key/current frame second modulation signal to generate the key/current frame image on the display (Col. 2, Ln. 35-50, FIG. 1).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine **Baik** teaching to receive a key/current frame image, to calculate a key frame first modulation signal based on the key frame image, and to

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determine a key/current frame second modulation signal based on the key/current frame image and the key frame luminance map with **Childers et al.** teaching to calculate a key frame luminance map of light from the first modulator incident on the second modulator, to drive the first modulator with the key frame first modulation signal and, to drive the second modulator with the key/current frame second modulation signal to generate the key/current frame image on the display in order to benefit of reducing time and cost by having a system comprising a processor configured to receive a key/current frame image, to calculate a key frame first modulation signal based on the key frame image, to determine a key/current frame second modulation signal based on the key/current frame image and the key frame luminance map, to calculate a key frame luminance map of light from the first modulator incident on the second modulator, to drive the first modulator with the key frame first modulation signal and, to drive the second modulator with the key/current frame second modulation signal to generate the key/current frame image on the display.

Regarding Claim **2**, **Baik** teaches a method according to claim 1 wherein step (d) comprises: (iv) returning to step (a) after the plurality of frames (Col. **11**, Ln. **14-17**, FIGs. **7 & 8**).

Regarding Claim **4**, **Childers et al.** teach a method according to claim 2 wherein calculating the current frame second modulation signal comprises:

comparing a plurality of pixels of the current frame second modulation signal with a second modulator range on a pixel by pixel basis (Col. **2**, Ln. **46-50**, FIG. **1**); and

updating the key frame first modulation signal and key frame luminance map (Col. 2, Ln. 60-65) if the pixels of the current frame second modulation signal are outside the second modulator range for a threshold number of pixels (Col. 3, Ln. 31-36, Ln. 52-58, FIG. 2).

Regarding Claim 5, **Childers et al.** teach a method according to claim 4 wherein updating the key frame first modulation signal and key frame luminance map comprises:

updating portions of the key frame first modulation signal and key frame luminance map (Col. 2, Ln. 60-65) which effect pixels for which the current frame second modulation signal is outside the second modulator range (Col. 3, Ln. 31-36, Ln. 52-58, FIG. 2).

Regarding Claims 6 and 19, **Baik** teaches a method according to claims 4 and 17, wherein updating the key frame first modulation signal and key frame luminance map comprises:

calculating the key frame first modulation signal using the current frame image as the key frame image (Col. 5, Ln. 43-48, Ln. 52-58, FIG. 1).

However, **Baik** does not teach calculating an approximation of the key frame luminance map.

In the same field of endeavor, **Childers et al.** teach calculating an approximation of the key frame luminance map (Col. 2, Ln. 35-50, FIG. 1).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine **Baik** teaching of calculating the key frame first

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modulation signal using the current frame image as the key frame image with **Childers et al.** teaching of calculating an approximation of the key frame luminance map in order to benefit of accommodating differences between modulations by having a method of calculating the key frame first modulation signal using the current frame image as the key frame image and approximating of the key frame luminance map.

Regarding Claims **13-15** and **26-28**, **Childers et al.** teach a method according to claims 2 and 17 respectively, wherein calculating the current frame second modulation signal comprises:

comparing a plurality of pixels of the current frame second modulation signal with a second modulator range on a pixel by pixel basis (Col. 2, Ln. **46-50**, FIG. 1); and

updating the key frame first modulation signal and key frame luminance map (Col. 2, Ln. **60-65**) if (an average (Claims 13 and 26)) (a cumulative (Claims 14 and 27)) amount (i.e. obviously deduced and well-known in the art) by which (at least one of (Claims 15 and 28)) the pixels of the current frame second modulation signal are outside the second modulator range exceeds a predetermined threshold (Col. 3, Ln. **31-36**, Ln. **52-58**, FIG. 2).

Regarding Claim **16**, **Baik** teaches a method according to claim 2 comprising receiving at least one future key frame image and calculating a future key frame first modulation signal and luminance map while the plurality of frames are being processed which is obviously implied because the next frame would be come the current frame (Col. 11, Ln. **14-17**, FIGs. **7 & 8**).

Regarding Claim **17**, **Childers et al.** teach a method according to claim 1 wherein calculating the current frame second modulation signal comprises:

comparing a plurality of pixels of the current frame second modulation signal with a second modulator range on a pixel by pixel basis (Col. 2, Ln. **46-50**, FIG. **1**); and

updating the key frame first modulation signal and key frame luminance map (Col. 2, Ln. **60-65**) if the pixels of the current frame second modulation signal are outside the second modulator range for a threshold number of pixels (Col. 3, Ln. **31-36**, Ln. **52-58**, FIG. **2**).

Regarding Claim **18**, **Childers et al.** teach a method according to claim 17 wherein updating the key frame first modulation signal and key frame luminance map comprises:

updating portions of the key frame first modulation signal and key frame luminance map (Col. 2, Ln. **60-65**) which effect pixels for which the current frame second modulation signal is outside the second modulator range (Col. 3, Ln. **31-36**, Ln. **52-58**, FIG. **2**).

Response to Arguments/Amendments/Remarks

2. Applicant's arguments, see Page(s) 2-5 filed 07/16/2009, with respect to Claims 1, 2, 4-6, 13-19, and 26-32 have been fully considered and are not persuasive.

First of all, applicant argues that **Childers et al.** do not teach "calculating a key frame luminance map corresponding to light incident on the second modulator when the first modulator is driven by the key frame first modulation signal". However, the

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Examiner respectfully disagrees because **Childers et al.** disclose that "...the low-resolution color light array emitted or transmitted..." which is obviously meant that a key *frame luminance map (color light array) must be calculated corresponding to the second modulator (low resolution)*. Furthermore, **Childers et al.'s** (Col. 2, Ln. 35-50, FIG. 1) disclose that "...high-resolution light modulator 22 includes a plurality of mirrors or other reflective devices that correspond to individual display elements on screen 16..." which obviously meant that the *first modulator (high-resolution) is driven by the key frame first modulation signal (correspond to individual display elements)* as broadly interpreted.

Secondly, applicant argues that **Baik** does not teach "determining a current frame second modulation signal based on the current frame image and the key frame luminance map". However, the Examiner respectfully disagrees because **Baik's** (Col. 9, Ln. 13-21, FIG. 6) discloses that "...the back light control 64 generates a brightness control signal Dimming to correspond to the area to which the current control value belongs..." which is obviously meant that a *current frame second modulation signal (control signal Dimming) must be determined (to generate) based on the current frame and the key frame luminance map (a brightness, apparently from current frame, correspond to the area)*.

Finally, in response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413,

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208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to VINH T. LAM whose telephone number is (571)270-3704. The examiner can normally be reached on M-F (7:00-4:30) EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amare Mengistu can be reached on (571) 272-7674. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Vinh T Lam/
Examiner, Art Unit 2629

/Amare Mengistu/
Supervisory Patent Examiner, Art Unit 2629